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JAPANESE SUGAR CANE.

Japanese sugar cane (*Saccharum officinarum*) is a true sugar cane and nearly related to the ordinary sugar cane, or "ribbon" cane of the Tropics. It rarely produces flower heads or seeds in this country and is propagated only by canes and cuttings. Some seedsmen offer "Seeded Ribbon Cane" and "Seeded Japanese Cane," but these are varieties of sorghum and are only distantly related to the true Japanese cane, of which no seed has ever been on the market in the United States.

History and description.—Japanese cane was first introduced into this country in 1878 by Hon. W. G. LeDuc, then United States Commissioner of Agriculture, and it is from that importation that most of the Japanese cane now in this country has been grown.

The cane differs from the ordinary varieties of sugar cane in the South in having much more slender and more leafy stems. It makes a more vigorous growth on thin and sandy soils, withstands a lower temperature without injury to its roots, and bears drought much better. These characteristics enable it to grow over a wide area, which includes Florida and the cotton region as far north as central Georgia and Mississippi.

Japanese sugar cane was first introduced as a sugar and sirup-making crop, but has not proved popular for that purpose. It is difficult to strip the leaves from the stalks before grinding, and the sirup made from it has a peculiar flavor, which is not attractive to some, though highly prized by others. It produces heavily, yields of 600 gallons of sirup per acre being reported from central Mississippi, and about the same amount from southern Georgia. The canes are harder to grind than those of either sorghum or ribbon cane, although the actual sugar content is about the same as that of the ordinary sugar cane. The principal value of the crop, as determined by about forty years of use, has proved to be as a silage and forage crop rather than as a sugar producer. Several varieties of Japanese cane have been introduced recently, but there are small differences between them except that some have larger stalks than others.

Soil.—Japanese cane, like all other sugar canes, makes its best growth and heaviest yields on the most fertile soils, but still will outyield almost any other forage crop on soils which are not fertile provided they are fairly well drained. It makes a very heavy growth on the rich, peaty soils of Florida, and yields of over 27 tons of green forage per acre are reported from the light and rather sandy soils at

the State experiment station at Gainesville. The Texas station reports a yield of more than 18 tons per acre at the Beaumont substation.

Preparation of the ground.—The land on which Japanese cane is to be planted should be given thorough preparation, as the crop will occupy the ground several years. Deep plowing is especially important where the soil is heavy. The Texas station reports a gain of over one-third in yield where the ground was plowed 12 to 14 inches deep over that secured where the plowing was only 5 or 6 inches, this result being the average of six tests made at Angleton and Beaumont. If the soil is peaty or is deficient in lime, an application of ground limestone, 4 to 6 tons per acre, will be profitable. On lighter soils a previous crop of cowpeas or of velvet beans or a heavy application of stable manure makes an excellent preparation.

Planting.—The cane should be given an abundance of space in planting, 6 feet between the rows being the narrowest space advisable and many planters giving 8 feet. Planting may be done in either the fall or spring. In southern Florida and Texas fall planting is usually practiced, while in sections farther north spring planting is safer, but the method of planting is the same at either season. Deep furrows should be opened, either with a "middle-buster" or a double disk with the sections set very close together. The canes are then laid in a double row in the bottom of the opened furrow, taking care that they "break joints" so as to bring the lower end of one cane opposite the middle of its neighbor. The canes are then covered, either by using a plow or by reversing the disking, setting the disks rather wide so as to leave the ground nearly smooth. This is the best method when a sufficient supply of canes, 3,000 to 3,500 per acre, is available, that number of canes weighing from 1 ton to a ton and a half. When the number of seed canes is not sufficient for such planting they may be cut into pieces about 2 feet in length and planted in a single line. The canes should be covered to a depth of at least 6 inches. Whatever method may be followed it is important to plant so thickly as to secure a good stand the first season, as it is almost impossible to fill out a ragged stand. It is much better to secure a full stand at once, even though all the desired area is not planted, as good canes planted in a favorable soil will give 50 to 75 canes to each hill the following season. In all cases the canes should be examined carefully before planting, to see that they are sound. The buds should be plump, hard, and of a light yellowish green color. If they are blackened or are soft and watery, they will not grow.

Cultivation and fertilizing.—No special cultivation is needed except to keep the soil mellow and to prevent the growth of weeds. As all the old fibrous roots of the cane die during the winter, the first cultivation in the spring should be as deep and thorough as possible. The later cultivations should be shallow, in order to avoid breaking the new roots which soon spread across the entire space between the rows.

Any crop which produces such heavy yields and occupies the ground several successive years requires more or less fertilizing. The character of the fertilizer used seems to have little effect on the quality of the cane but is of value only in stimulating a heavier growth, and for that purpose whatever fertilizer may be used should be rich in nitrogen; potash is desirable but not always effective; while the use of phosphoric acid has seldom given profitable results. Some of the southern agricultural experiment stations which have made fertilizer tests with the crop recommend the use of 300 to 500 pounds per acre of such a fertilizer as is used on ordinary sugar cane. As the new roots of the cane start late in the spring, after the tops have made some inches of growth, chemical fertilizers should not be applied too early or considerable will be lost by leaching. Many recommend that such fertilizers be given in two applications, the first when the plants begin growth in the spring and the other about midsummer.

It has been the usual experience that the yield of cane decreases after the first or second year and that plantings are not usually profitable after four or five years. This is not always the case, however. At Biloxi, Miss., the cane has been grown for 14 years. New plantings have been made nearly every year since 1904. It is planted in rows 6 to 7 feet apart. Early in the spring the rows are "barred off," running the plow as deep and as close to the row as is possible, throwing the soil away from the row. The opened furrow is then given a heavy dressing of fresh stable manure, which is covered by plowing the entire space between the rows and throwing the dirt back against the rows, the after cultivations being shallow. With that treatment the crop has shown a constant increase for 8 to 10 years, and one planting had continued to give profitable yields for 12 years. Where the planting is not likely to be profitable more than five years it is best to plow up about one-fifth of the field each year and make a new planting, so that at least a part of the field will be in its prime every year.

Uses.—While the cane is used to a considerable extent for the manufacture of sirup, its principal uses are for grazing and for making silage. For whatever purpose it may be used it should not be harvested too early, as its sugar content increases rapidly toward the end of the growing season. The best time for cutting is a few days before the first sharp frost in the fall, but as that time can not be known in advance it is safer to cut it, either for windrowing seed canes or for the silo, so early that there will be little danger of loss from freezing. This is especially important when seed canes are to be saved, as the buds are killed by very moderate frosts.

Japanese cane is used more for grazing cattle than for other animals, and when used for that purpose there is little waste even late in the season, as the cattle eat the leaves first, then the tops, and

finally a good part of the canes. The grazing is greatly improved when velvet beans or kudzu are grown with the cane. When the cane is planted in 8-foot rows, a row of velvet beans may be planted in the middle of each space and will not interfere with cultivation until the ground is so shaded that further working is not needed. The cane will afford the needed support for the bean vines, and the mixture makes a much richer feed than the cane alone. When the cane is planted in narrower rows the beans are often planted in the same rows, but if the cane makes a heavy growth they are liable to be so shaded and dwarfed that they will make little growth. Kudzu should be planted in the same rows with the cane, where it makes a heavy growth after the first year. These mixtures make very satisfactory winter grazing, as the feeding value of neither is seriously injured by moderate freezing. It is not desirable to plant beans or kudzu with the cane when it is to be cut either for fodder or the silo, as the vines tangle the canes together so that they are difficult to handle. When wanted for winter fodder the cane may be cut and shocked in the field, and though there will be a little loss from weathering on the outside of the shocks this loss will not be serious if the shocks are well tied with binding twine or baling wire near the top, to keep them from being blown down. When the canes are stored by standing them on end in a barn or shed, care must be taken that the butts of the stalks are not crowded too closely or there may be loss from molding.

There are few crops which will produce such heavy yields for silage at so low a cost. The Texas station reports the expense for man and team labor for harvesting a crop of 23 tons per acre at \$1.25 per ton. Some who have used the silage claim that its feeding value is low, especially for beef cattle, while others, and a large majority of the users, claim that it is fully equal to the silage made from sorghum. It is probable that some of the unfavorable reports came from those who had used silage made from cane which was immature when cut and consequently deficient in sugar, which is not developed largely until late in the season. There have also been a few complaints that the outside covering of the cane is so hard that the pieces of silage sometimes cut the mouth of an animal eating it. That may be the case when the silage is cut too long, but there will be no trouble from that cause when the silage cutter is adjusted to cut the canes into pieces only half an inch or less in length.

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